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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,424	01/10/2002	Yasuhiro Yoneda	217771USOPCT	3839

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
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EXAMINER
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UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/030,424

Applicant(s)

YONEDA ET AL.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7, 9, 11-20 and 28-32 is/are pending in the application.
- 4a) Of the above claim(s) 9, 14-23, and 28-30 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4, 6-11 and 13 is/are allowed.
- 6) ☒ Claim(s) 5, 12, 31, and 32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Claim 31 is objected to because of the following informalities: On line 8, "acit" should read --acid--. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 5, 12, 31, and 32 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kaufman (US '489).

In Kaufman's Description of the Art, "In a typical process, via holes are etched through an interlevel dielectric (ILD) to interconnection lines . . . Next, a thin adhesion layer . . . is generally formed over the ILD and is directed into the etched via hole. Deposition is continued until the via hole is filled with the blanket deposited metal. Finally, the excess metal is removed by chemical mechanical polishing (CMP) to form metal vias" (column 1, lines 49-54 and 56-59). Kaufman also teaches, "A chemical mechanical polishing slurry comprising at least two oxidizing agents, an organic acid and an abrasive . . ." (Abstract). ". . . A wide range of conventional organic acids, salts or organic acids, and mixtures thereof are useful in the CMP slurry of the present invention to enhance the selectivity of oxide polishing rate. . . . Preferably the organic

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acid is selected from the group of acetic acid (same as applicant's organic etching acid), . . . lauric acid, . . . myristic acid, . . . palmitic acid, . . . stearic acid (same as applicant's aliphatic carboxylic acid having 7 to 24 carbon atoms), . . ." (column 6, lines 7-14). "The CMP slurry may be produced using techniques known to those skilled in the art. Typically, the oxidizing agent and any optional additives, are mixed into the aqueous medium, such as deionized or distilled water, . . ." (column 7, lines 55-61). Kaufman further teaches, "The organic acid or salt should be present in the final CMP slurry, individually or in combination with other organic acids or salts, . . ." (column 6, lines 15-19). The aforementioned reads on,

A polishing liquid composition for polishing a surface to be polished comprising an insulating layer and a metal layer, the polishing liquid composition comprising:

an aliphatic carboxylic acid having 7 to 24 carbon atoms, an etching agent comprising an organic acid, and water, wherein the organic acid of the etching agent is at least one selected from the group consisting of A: aliphatic organic acids having 6 or less carbon atoms and one to three carboxyl groups, **in claim 5**; and

an oxidizing agent, an abrasive or a mixture thereof, **in claim 12**.

Kaufman also teaches, well-known polishing slurry additives may be incorporated into the chemical mechanical polishing slurry of this invention, which includes phosphonic acids such as aminotri(methylenephosphonic acid) (column 6, lines 29-55), which also reads on,

An aliphatic carboxylic acid having 7 to 24 carbon atoms, an etching agent comprising an organic acid, and water, wherein the organic acid of the etching agent is

at least one selected from the group consisting of C: organic acids having 6 or less carbon atoms and one to four phosphonic groups, **in claims 31 and 32.**

***Allowable Subject Matter***

4. Claims 1, 2, 3, 4, 6, 7, 11, and 13 are allowed.
5. The following is an examiner's statement of reasons for allowance:

As to claims 1-4, 7, and 11, applicants presented persuasive arguments (Remarks filed 7/29/2004, pages 10-11) to show Nishimoto (US 6,383,240), filed on September 29, 2000 disqualifies as prior art in the 103(a) rejection of claims 1-3, 7, and 11 because the present application has an earlier effective U.S. filing date of July 7, 2000, which is the international filing date of the national stage application of the present application (See, e.g. MPEP 1893.03(b)). Hence, the prior art of record taken alone or in combination fails to suggest, teach, or render obvious a polishing liquid comprising:  $R^1-X-(CH_2)_q-[CH(OH)]_n-CH_2OH$  in combination with the rest of the limitations of the said claims.

As to claim 6 and 13, the prior art of record taken alone or in combination fails to suggest, teach, or render obvious a polishing liquid composition comprising an amine represented by the general formula:  $R^3R^4R^5N$  in combination with the rest of the limitations of said claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Response to Arguments***

6. Applicant's arguments filed July 29, 2004 have been fully considered but they are not persuasive. Applicants traverse the 102(b) rejection over Kaufman (US 5,783,489) as failing to disclose or exemplify specific combination of (i) aliphatic carboxylic acid having 7 to 24 carbon atoms and/ or a salt thereof and (ii) the recited etching agent, in claim. Applicants argue the rejection of the said claims should be withdrawn because the combination of glycolic acid and citric acid, which belongs to group (ii) etching agents that appears in Kaufman's list of acids, fails to prevent dishing (see Specification, Table 4. Comparative Example II-6).

Applicants' argument is unpersuasive because the claims fails to exclude other combinations of (i) aliphatic carboxylic acid having 7 to 24 carbon atoms and/ or a salt thereof and (ii) the recited etching agent, which are comprised of and disclosed in Kaufman's list of acids (Kaufman, column 6, lines 2-14).

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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ltue

October 10, 2004

NADINE NORTON  
SUPERVISOR

